

ATOMIC ENERGY

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Dear Sir:

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Stock and assets of Kellogg Corporation, one of the principal engineering firms in the field of atomic energy, have been sold to Vitro Manufacturing Co., Pittsburgh, it was learned last week from M. W. Kellogg Co., New York, parent organization of Kellogg. (Kellogg is a subsidiary of Pullman, Inc., Chicago.) Kellogg, set up during World War II, did the vast architect-engineering work for the K-25 and K-27 gaseous diffusion uranium-235 production plants at Oak Ridge; has done process design and engineering work at Hanford Plutonium Works; was responsible for process design of Dow Chemical Company's fissionable material chemical separation units, now being used for the AEC; and now holds contracts with the AEC for other work which in the field of atomic energy development will be continued at the special projects division of M. W. Kellogg, in Jersey City, N. J. Vitro came into atomic energy work as a maker and supplier of colors and chemicals for the ceramics industry. Here, its uranium metal refining work, carried on when one of uranium's main uses, in pre-World War II days, was as a pigment, gave it the experience to refine the larger amounts of uranium ore which the requirements of the atomic program demanded. Now, in addition to AEC contracts which it holds, and its very large stake in atomic energy activity through acquisition of Kellogg, Vitro has been increasingly interested in uranium mineral development work in the United States.

Senate confirmation of Sumner T. Pike, nominated by President Truman to a 4-year term as AEC Commissioner, was held up last week by Senate members of the Joint Congressional Committee on Atomic Energy. (The other nominees--Thomas E. Murray, Henry DeWolf Smyth, and Gordon Dean--were unanimously confirmed.) Four Republicans and one Democrat, of the Joint Committee, voted against confirmation of Mr. Pike; four Democrats voted for it. The lone Democrat against him, Senator Edwin C. Johnson, Colorado, has quarrelled with Pike over prices paid Colorado uranium ore producers; it is the general feeling in Colorado that the AEC does not pay enough for the low grade ores that occur there.

A report by General Electric Co. on its activities in the field of thermo-nuclear weapons; details of its accomplishments to date on a Naval vessel propulsion nuclear reactor (AEN 4/25/50, p.1); and G-E's newly extended AEC contract were discussed at meetings recently held in Washington between G-E and the Joint Congressional Committee on Atomic Energy. General Electric's role in thermo-nuclear weapon development concerns the use of one of the plutonium reactors at Hanford Works (G-E operated) to manufacture tritium, basic component of such weapons.

AT THE ATOMIC CITIES & CENTERS IN THE UNITED STATES...

OAK RIDGE, Tennessee- A two week course in instrumentation for radio-isotope work will be given here September 5-15 by the Oak Ridge Institute of Nuclear Studies. Fundamental instrumentation for applied nuclear science problems will be emphasized. The course will be of interest to chemical instrument specialists, electrical engineers, physicists, or others specializing in instrumentation. One day each week will be spent on such subjects as proportional counters, construction practices, fast circuits, electrometers, scintillation counters, and the like. Details of the course may be secured from Special Training Division, Oak Ridge Institute of Nuclear Studies, P. O. Box 117, Oak Ridge.

The isotope research and semiworks building, a unit in the \$19,000,00.00 enlargement and modernization of Oak Ridge National Laboratories, has again been let out on bid (no.-401-50-20A, due July 19th). All previous bids received for construction of this facility were rejected. Other new research facilities in this expansion program include a research building, a physics of solids building, an instrument laboratory, and a health-physics calibration building. In addition, renovation of certain facilities will be undertaken. This embraces work on a pile building; fan house; separations building; solvent column building; demineralizing building; at the technical and biology divisions of Y-12, the electromagnetic separation plant; and gas decontamination facilities. Actual construction on certain items of this program was begun February, 1949, and the entire program is expected to be completed by June, 1952.

ARCO, Idaho- A radiation background study, in the area of the reactor testing station here, will attempt to establish the natural radiation level of this region. The survey will include analysis for radioactivity of representative samples of plant and animal life, soils, water, and air of the plains area. As part of the study, a \$9,000.00 contract has been made with Idaho State College, Pocatello. Under this contract, the college will collect animal and plant samples in the reactor testing station area, and do spot chemical analyses of soil and water samples.

A lump-sum contract has now been negotiated between the AEC here and the firm of Ashton, Evans and Brazier, Salt Lake City, for architectural and engineering design work. The firm's work will include designing and remodeling structures and utilities, and master planning of the central facilities area at the reactor testing station here. The AEC said that 21 firms were considered before Ashton, Evans and Brazier were selected. Mr. B. E. Brazier, a member of the firm, served during World War II as architectural designer and superintendent of buildings and grounds for the AEC installations at Los Alamos.

RICHLAND, Washington- The various safety measures which prevent radioactive pollution of the Columbia river were under discussion here last week. U. S. Public Health Service officials, members of the Columbia river advisory group, and other health and sanitary engineering specialists conferred on this phase of the continuing stream contamination studies of the atomic energy program. (This work, part of the environmental engineering activity of the atomic energy program, includes besides this evaluation of pollution hazards to ground and surface waters, such studies as determination of the efficiency of waste disposal systems and geological and meteorological aspects of reactor operations and processing methods. In 1950, and 1951, these environmental studies will involve a water decontamination study by the AEC as a joint effort with the U. S. Army Engineers, the Armed Forces Special Weapons Project, and the Chemical Corps; a study by the U. S. Geological Survey of sub-surface water movements and mechanisms of absorption as an aspect of effluent control; and a survey by the U. S. Weather Bureau of data collected at all AEC stations for use in future planning.)

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Landsverk Analysis Unit, Model L-75. Consists of a quartz fibre electrometer and microscope assembly, with an ionization chamber and built-in charger, and accessory equipment for holding samples. Electroscope unit made of bakelite; weight, 5-oz. Size: 3-in. diameter, and 8-in. high. Wall thickness of chamber, 3/32 in. Manufacturer states that in many applications, sensitivity is equal to or better than perfectly adjusted counter-scaler units. Accuracy of 1% said to be possible, with 2 or 3% average performance. Offers advantages of large economy in first cost, upkeep, space required, and technicians' time.--Landsverk Electrometer Co., Pippin Road, Cincinnati 31, Ohio.

Radiation Monitor, A.C.-operated, Model -K900. Equipped with aluminum thin-wall Geiger tube, sensitive to both beta and gamma radiation. Disintegrations detected by flashing neon light, loudspeaker, and count rate meter, reading 10,000 or 1,000 cpm., full scale. Selector switch also enables meter to be used for reading high voltage applied to Geiger tube. Size: approximately, 8-in. square. Weight: 15-lb.--Kelley-Koett Manufacturing Co., Covington, Ky.

Alpha-beta-gamma Portable Counter, Model 2611. Battery operated; uses thin mica end-window probe with density of 1.4 mg/square cm. Window is roughly equivalent to 1 1/2-cm. of air, enabling instrument to be used for monitoring alphas, as well as beta-and gamma-rays. Meter reads directly in counts per minute, and for gammas, in mr/hr., with selector switch enabling three ranges to be read on meter: 0.2, 2, or 20 mr/hr., full scale. Watertight case. Furnished with headphones.--Nuclear Instrument & Chemical Corporation, Chicago 10, Ill.

ATOMIC PATENT DIGEST...latest U.S. & British applications & grants...

PATENT COMPENSATION BOARD, AEC- Frederick P. Fulmer, whose claims for an award were based on, (1) additives to increase explosive force of an atomic bomb, and (2) aerosol defense against atomic bomb, has had all claims disallowed in a decision recently rendered by this Board...New applications filed for an award now include: Sven Lindequist. Claims are based on (1) Machinery for producing energy from atomic radiation; (2) Inexpensive atomic bomb system, Lindequist; (3) Depth bombing, system Lindequist, and (4) Atomic bomb, system Lindequist. James Bliss MacLean. Claims are based on a report entitled "Process and apparatus for generating electric power from fissionable material".

PATENTS AVAILABLE- The following patents, the outgrowth of nuclear research, and owned by the U. S. Government, are now available on a royalty free basis (non-exclusive). Applicants for licenses should address Chief, Patent Branch, USAEC, Washington 25, D.C. No.-2,506,944, Neutron meter; No.-2,506,945, Treatment of pitchblende ores; No.-2,507,301, Apparatus for controlling magnetic fields; No.-2,507,321, Leak testing device; No.-2,508,234, Distillation apparatus; No.-2,508,989, Apparatus for purifying gases; No.-2,509,009, Insulating column structure; No.-2,509,700, Radioactivity measuring devices; No.-2,510,850, Methods of producing uranium fluorides; No.-2,510,864, Catalysts for fluorination; No.-2,510,872, Regenerating antimony pentafluoride; No.-2,510,930, Measuring limited current changes; No.-2,511,667, Chemically concentrating isotopes of carbon; No.-2,512,538, Electric discharge device.

PATENTS GRANTED, BRITISH- Cathode for ionization counter tube. Brit. Pat. No. 640,840, issued June 7, 1950, to E. E. Shelton and G. A. R. Tomes, trading as 20th Century Electronics.

Apparatus for sorting radioactive ore. Reference 15855/49; to be issued to Eldorado Mining & Refining (1944) Ltd.

PATENTS GRANTED, UNITED STATES- Method of producing an alpha-ray source. Radium emanation is deposited in a solid state in a finely divided solid supporting material, and maintained in such a solid state until it has decayed to radium-D and polonium. U.S. Pat. No. 2,510,795, issued June 6, 1950; assigned to Canadian Radium & Uranium Corp., New York.

RAW MATERIALS...radioactive ores & other essentials for nuclear work...

UNITED STATES- The entry of Climax Molybdenum into the uranium field is now assuming definite proportions through the activities of Climax Uranium, a joint endeavor of the Molybdenum company with Minerals Engineering Co. Plans of Climax Uranium to rehabilitate a former sugar processing plant to house a uranium mill, at Grand Junction, Colo., are approaching the construction stage. Company officials said work would probably be done by Stearns-Roger Construction Co., Denver. The mill, which will process uranium-vanadium ores, will have a capacity of from 50 to 100 tons of ore per day, and will be supplied largely by ore from mining properties of Minerals Engineering Co., and by adjoining properties, to be taken under lease

CANADA- In the area north of Ace Lake, in Beaverlodge Lake vicinity, northern Saskatchewan, several pitchblende finds have been made at the Strike group of claims, not far from Eldorado Mining and Refining Company's Ace shaft. Assays of samples have shown high grade pitchblende.

Ontario's uranium center, the Montreal river area on the east shore of Lake Superior, north of Sault Ste. Marie, is experiencing more activity than it did a year ago. At Ranwick Uranium Mines, the most advanced of the properties here, mill tests on material from the main showing gave uranium in recoverable form as pitchblende. When concentrated into saleable form, the pitchblende indicated a recovery of 80% of the contained uranium. Four bulk samples ranged from 0.165% to 9.38% uranium oxide...At Labine-McCarthy Uranium Mines, to the southeast of Ranwick, underground work has been contracted for, and equipment is being moved in...At Damascus Mines, lying between Ranwick and Labine-McCarthy, camps are being set up in preparation for exploration this Summer. Preliminary work has already shown pitchblende at two points on Damascus...Other groups active in this area include Roche Long Lac; Arctic Yellowknife; Soo-Tomic Uranium Mines; and Chisholm Syndicate.

ALGERIA- With the discovery of uranium minerals here at Hamman-Bou-Hadjar, Department of Oran, the Commission for Atomic Energy Research has made a request to the Central Administration for permission to develop this occurrence. The workable surface is reported to cover 400 hectares, and the uranium content has been placed at approximately 1%.

IONIZING RADIATION... investigations & notes...

The lethal action of x-rays upon wasps has been investigated by A. M. Clark, and E. M. Kelley, Dep't. of Biological Sciences, University of Delaware, Newark, Delaware. The wasp *Habrobracon* was used, and prepupae and pupae were exposed to x-radiation. Eclosion ratios showed that the x-rays have a greater lethal effect upon haploid males than upon diploid males or diploid females. Diploid males and diploid females were found to be equally susceptible to the lethal effects of x-radiation; prepupae were more sensitive than pupae. A comparison of adults developing from irradiated prepupae and pupae revealed that a greater number of haploid males showed structural malformation than do diploids, irrespective of sex, and that the haploids show the malformation to a greater degree. The data also showed that diploids are more resistant than haploids to the lethal action of x-rays, suggesting that the number of chromosome sets is a factor in determining the radiosensitivity of cells.

Blood transfusions combined with the antibiotic drug aureomycin have proven effective in treating victims of excess ionizing radiation, a University of Chicago research team told the annual meeting of the American Medical Association, in San Francisco last week. In experiments with dogs, J. G. Allen, P. V. Moulder, and D. M. Enerson, Medical Center, University of Chicago, found that two out of the ten dogs given this treatment survived the critical six week period following exposure that ordinarily would result in death. Neither aureomycin nor blood transfusions were successful alone, although the aureomycin allowed the animals to survive longer.

RADIOISOTOPES...as used for tracer & therapy applications...

Anticipating human experimentation involving carbon-14, a study has now been made of the effect of a single dose of carbon-14 labeled sodium bicarbonate on the pattern of deaths from spontaneous leukemia in mice. The work, by H. E. Skipper, M. J. Bell, and J. B. Chapman, at Southern Research Institute, Birmingham, Ala., was part of an investigation into the hazards in research involving the use of carbon-14. The amount of carbon-14 injected into the mice (of leukemia-susceptible Akm strain, brother-sister inbred) was equivalent to a dose of about 50 mc for a 70-kg man on a weight basis. The experimenters point out that such a dose is not likely to be inadvertently taken into the body of a cautious experimenter in an ordinary investigation. However, (they observe) this level is not an unreasonable requirement for certain types of human experimentation if, and when, such use of carbon-14 is allowed by the AEC. In this particular experiment, the leukemia-susceptible mice were injected with the C-14 labeled sodium bicarbonate at the rate of 18 microcuries per mouse. It was found that this dose had no significant effect on the pattern of deaths from leukemia in this strain of animal.

ATOMIC ENERGY DEVELOPMENTS ABROAD...GREAT BRITAIN...

A second electromagnetic isotope separation plant has been completed at the Atomic Energy Research Establishment, Harwell, and the collection of separated isotopes has started. A small electromagnetic separator has been running at Harwell for two years and has been supplying samples of isotopes of light elements for nuclear physics work. The new plant is capable of separating for experimental work gram quantities of the isotopes of the heavy elements, including uranium, at a high degree of enrichment; first separations were carried out in May. The new plant was designed by Harwell staff, and was manufactured by Metropolitan-Vickers Electrical Co., Ltd., in conjunction with the General Electric Co., Ltd., and British Thomson-Houston, Ltd.

Major objectives in industrial utilization of nuclear fission were pointed out in a recent lecture at Oxford by Sir John Cockcroft, Director, AERE, Harwell. First objective (he said) is to perfect economical extraction of low-grade uranium ores (20 times as abundant as silver); the second is to develop the breeder atomic pile. As to nuclear fission for power purposes, he gave as a condition the successful use of 1% uranium. Then, he observed, in an atomic powered generating station, one ton of uranium ore would replace the 300 tons of coal required in conventional generators. Such savings would not pass intact to the profit account. Much of it would be required to offset the high chemical engineering costs for uranium extraction and metal making.

In addition to Harwell, which is the research center, Britain's nuclear work is also carried on at Risley, design headquarters; Springfields, uranium refining; Windscale Works, Sellafield, the plutonium reactor; Radiochemical Center, Amersham, the radioisotope processing center; and (in the future) at Capenhurst, near Chester, a new establishment, under construction. Activities embrace a wide field of endeavor. Pilot plant studies have now led to the development of methods of producing plutonium metal, and a new method of producing uranium metal, more economical than methods previously used. Encouraging process has also been reported in the production of beryllium metal shapes, while a new method of preparing pure zirconium on a production scale shows much promise. Other studies include heat transfer problems at very high transfer rates, using liquid metals in closed circuits. As to radioisotope production, during May of this year, 552 consignments of isotopes were produced, mostly for export. This compares with the approximately 600 shipments now being made each month from Oak Ridge, Tenn., by the USAEC.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

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